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# Rural to Urban Transitions at Shanghai's Fringes

## *Explaining spatial transformation in the backyard of a Chinese mega-city with the help of the Layers-Approach*

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**Abstract:** Delta's are strategic, but at the same time vulnerable ([Ke, 2014](#); [Balica, Wright, & van der Meulen, 2012](#)). This paper will explore the (spatial) consequences of urban pressure on Shanghai's rural fringes, focusing on the case of Chongming Eco-Island, which belongs administratively to Shanghai. The current top-down policy to transform Chongming into an Eco-Island is not yet working as promised in various policies. Via field observations, interviews with more than twenty-five stakeholders, and policy reviews, this paper explores to what extent the plans of the national government on Chongming Eco-Island are being implemented and how it is possible to steer the developments into a more sustainable direction. To be able to mitigate the negative impacts for the natural and man-made environment a transition in spatial planning and design approaches is urgently needed. For this to occur, it has to be made clear which factors can explain the process of seemingly unbridled urbanisation at Shanghai's fringes, and which role planning processes play in this development. The so-called Layers-Approach will be used to visualize this complexity of different spatial claims and interest. This approach has been proven to be useful as a tool for classification to be able to distinguish priorities and responsibilities for policy choices. Based on this, some recommendations will be made in this paper to steer the spatial development into a more resilient direction and hopefully mitigate the collateral damage for nature and society caused by current spatial planning and design practices.

## 1. INTRODUCTION

### 1.1 Extreme urbanisation in the context of a vulnerable delta

While in most parts of the world the majority of the population lives in urban areas, most of the people in Asia and Africa still live in rural conditions ([United Nations, 2014](#)), but this is changing rapidly. Unprecedented numbers of housing and urban infrastructures are appearing on former rural lands. A big share of this urban expansion occurs in river

deltas, which have always been strategic locations for trade and fertile grounds for food supply. However, deltas are also extremely vulnerable due to loss of fertile agricultural land, the loss of natural diversity, and flood risk, being key concerns that threaten life in urban deltas ([Campanella, 2014](#)).

Without doubt the most extreme and unprecedented examples (in terms of rapid and large-scale urbanisation) can be found in China, with millions of people on the move, currently cumulating in the formation of urban mega-regions ([Friedmann, 2005](#); [United Nations, 2014](#)) and ruralopolises ([Qadeer, 2000](#)). These new mega-regions are mainly economically defined without much consideration for underlying natural and historical landscapes.

Within China the Yangtze River Delta Region is currently the largest urban mega-region ([World Bank and the Development Research Center of China's State Council, 2014](#)) and nicknamed 'Head of the Dragon': opening its mouth to the world, with the Yangtze River as its body and tail. This accumulation of economic power and concentration of people in the Yangtze River Delta has deep historical roots ([King, 1911](#)); it is here where tensions between economic, spatial, and ecological interests are currently in an almost apocalyptic state.

During the last two decades, cities in the Yangtze River Delta have been expanding explosively with many hundreds of square kilometres of new urban areas built yearly, usually right on top of fertile agricultural and natural grounds of the delta. In terms of physical scale and economic impact Shanghai is the key player, centrally positioned in the Yangtze Estuary: economically strategic, but also extremely vulnerable when it comes to ecology, fertile agricultural lands, and flood risk ([Balica, Wright, & van der Meulen, 2012](#); [Brown, 1995](#); [Den Hartog, H., 2013](#); [Ke, 2014](#); [Wang, 2012](#)). An urgent concern is land scarcity, and this is worsened by a seemingly uncontrolled urban expansion and spatial fragmentation, causing inefficiency and even more loss of fertile land. A series of on-going land reclamations released the pressure temporarily; though they bring collateral damage to existing eco-structures and wetlands and increase the flood risk.

The confrontations are the most extreme and pressing in the urban fringes, due to the temporary transition zone between rigid urban expansion and still existing natural capital and rural values. For this paper Chongming Island in Shanghai is chosen as an illustrative case for the enormous urban pressure. First of all Chongming Island is a very pure, almost virgin case with high natural and agricultural values, since it has been isolated as an island until recently. Since 2009 it has been connected by a bridge-tunnel combination – before that it used to be hardly accessible. This has resulted in rapid changes in landscape, infrastructure, land use and lifestyle. Secondly Chongming Island has been appointed by the Central Government in Beijing as an Eco-Island since 2001: a National showcase and pilot to show the world how sustainability can be achieved. Thirdly, Chongming Island was the last rural county within Shanghai's direct-controlled municipality (equal to a province), and has received urban status since January 2017. The status quo of the island's rural to urban transition is rather unique and can clearly illustrate the current tensions in different spatial claims and ambitions regarding rural to urban transitions.

The island has a long history of urban influences and large-scale spatial interventions (e.g. large scale land reclamations and state farms in the 1960s, large scale relocation projects late last century and more recently the planning of a series of new towns). The island plays a main role in regional and even international eco-systems, especially as a resting place for migratory birds (the eastern tip of the island contains two Ramsar zones,

which were appointed in 2002 by the Convention on Wetlands of International Importance, on behalf of several UN agencies and international non-governmental organizations). In short the conflicts in land use and occupation are extremely felt here.

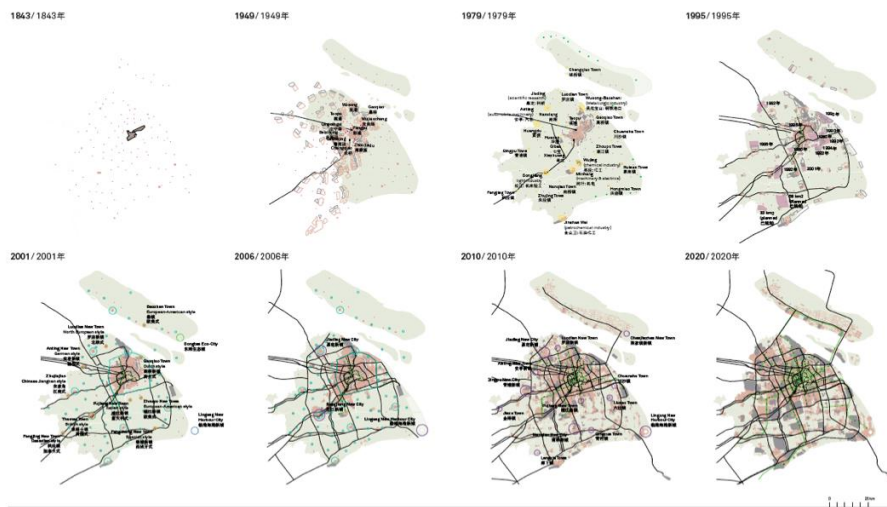


Figure 1. Urban growth of Shanghai's direct-controlled municipality (maps by author)

## 1.2 Sectorial and mechanical approach

Large-scale urban expansion requires good planning and good governance. Worldwide urban development processes have been dominated by modernism. Especially during the post-war part of last century the common idea was that blueprint planning could control social and physical processes. Currently the discourse is changing due to a series of dramatic natural and social clashes (e.g. Hurricane Katrina in New Orleans, 2005, Hurricane Sandy in New York, 2012) showing that a more flexible and resilient approach is urgently needed in spatial planning and design worldwide. This aims to bring the different spatial claims and interests (agriculture, economy, ecology, housing, water safety, et cetera) into a more sustainable and resilient balance ([Scheffer, 2009](#)).

Spatial planning and design in China faces two main problems. First of all, there is a lack of transparency in spatial planning processes, and inherently a lack of insight into how different factors relate to each other ([Ho, P., 2001](#); [Ho, S. P. & Lin, 2004](#)). Secondly the governance system seems to consequently not be steering towards resilient solutions in this complex context. Usually GDP-oriented motives are dominant in the decision-making ([He, Huang, & Wang, 2012](#)). Chinese spatial planning and design practices are usually extremely rigid in their implementation, and at the same time seemingly random, often with a lot of collateral damage for the environment and quality of life. To be able to mitigate the impact on the natural and man-made environment an extreme transition in spatial planning and design approaches is urgently needed. The question is how to achieve this and how to improve resilience, for example in the complex case of Chongming Island and in the wider context of the Yangtze Delta.

Thus, the aim of this paper is to develop a proper understanding and theorization of the phenomenon of a seemingly uncontrolled spatial development, and to be able to propose recommendations toward a more

resilient metropolitan development that is able to mitigate the negative impacts on the natural and man-made environment. To reach a proper understanding and theorization, the Layers-Approach is applied. It supports an integrated approach by describing and analysing various spatial claims and interests, aimed to clarify what should be the priorities in decision-making.

### 1.3 Structure of this paper

This paper will analyse and interpret the spatial impact of the seemingly uncontrolled urbanisation in the rural fringes of Shanghai during the last decade, focusing on the case of Chongming Island in the context of the Yangtze River Delta's estuary. This island has a clearly defined border, thus the impact of the urbanization can also be clearly defined. The 'isolation' of the island ended by the building of a 25.5 kilometre long bridge-tunnel combination in 2009 and additionally since January 2017 the State Council transformed the administrative status of the island from (rural) county to (urban) district. Both changes resulted in clearly identifiable urban impacts. Although, already since the end of the millennium there are increasing classifiable urban influences, Chongming Island has been the focus of various policies and studies on national, regional and local levels since the beginning of this century, in the context of being one of the world's fastest growing and largest metropolitan regions.

In the urban transitions discourse there are research gaps on the consequences of unbridled urbanisation in the Chinese context, especially regarding the interrelations between eco-system functioning, socio-economic systems, and spatial qualities ([Bucx et al., 2010](#)). There is also a gap in integral approaches to linking developments in the different layers, e.g. urban-economic and natural development ([Bucx et al., 2014](#)).

To collect the needed information, more than thirty in depth interviews have been recorded with local stakeholders, public and private: one official on Shanghai's direct-controlled municipality level, one official on a local district level, two officials at township level, two developers, several architects and urban planners involved in various planning and design projects on the island, local entrepreneurs, inhabitants and other stakeholders. Additional relevant literature studies and policy reviews have been done, and more than a dozen field visits, including three workshops with students and local stakeholders have been undertaken during the last ten years by the author of this paper.

## 2. ANALYTICAL FRAMEWORK AND RESEARCH METHOD

### Theoretical Framework

The main question is which factors can explain the process of seemingly unbridled urbanisation at Shanghai's fringes and which roles do planning processes play in this evolution? This is tackled by analysing the process, appearance and impact of a seemingly unbridled urbanization in Shanghai's rural backyard: the case of Chongming Island.

## Using the Layers-Approach in urban planning

To reach a proper understanding and theorization it is essential to analyse and evaluate the spatial transformations in the past, present, and expected future of spatial configurations and responsible governance systems. To achieve understanding and theorization, the Layers-Approach ([Dammers et al., 2014](#); [Bucx et al., 2010](#); [Bucx et al., 2014](#); [De Hoog, Sijmons, & Verschuuren, 1998](#); [McHarg & Mumford, 1969](#); [Sijmons, D. F., 1991](#); [Sijmons, D. & Feddes, 2002](#)) is used as a theoretical framework.

The Layers-Approach has been very influential in planning practices worldwide, especially in the European context where it has been further developed since the 1970s ([Kerkstra & Vrijlandt, 1990](#); [De Hoog, Sijmons, & Verschuuren, 1998](#); [Meyer et al., 2012](#); [Sijmons, D. F., 1991](#)), with several successful practical samples such as ‘Room for the River’ in the Netherlands. This was a pilot application to develop a more resilient and adaptive spatial planning approach with the help of a spatial framework that works with nature instead of competing or ignoring it. However, the approach also received a lot of criticism in the discourse ([van Schaick & Klaasen, 2011](#)). Testing its principles in a different context, which is far more extreme and complex, is adding to the criticism and contributes to the validation and critical assimilation of scientific knowledge. Hence this approach could frame this critique and needs to be developed further into a tailor-made approach for the Chinese context.

The Layers-Approach has been developed as a critique on mechanical top-down approaches of planners and engineers worldwide, who have tried to control nature, and have therefore often led to vulnerable situations ([Campanella, 2014](#)). In the Chinese context, the old-school mechanical and top-down approach is ubiquitous and even more extreme, especially since Mao’s ‘Man must conquer nature’ doctrine ([Shapiro, 2001](#)). Natural capital and rural values around Shanghai, have been neglected for a long time in favour of rapid urbanisation. Current planning practises in the Yangtze River Delta are based on a tabula rasa approach, and are usually steered by GDP-oriented motives, hence resulting in serious disturbances of the delta as a coherent system and a loss of resilience. However, recently rising problems such as subsidence and flooding, and increasing risks for natural hazards, and additional environmental pollution issues, have created more awareness in the discourse, both nationally and locally.

The Layers-Approach has its roots in the ideas of Ian McHarg, who wrote the ground-breaking book *Design with Nature* ([McHarg & Mumford, 1969](#)) in which he explained that man should conform to nature and ecology and work with it instead of competing with it. McHarg developed a mapping method that distinguished multiple aspects of a plot of land into multiple stacked layers, the so-called ‘layer-cake’. The approach has been developed further by (amongst others) [De Hoog, Sijmons, and Verschuuren \(1998\)](#).

According to [Sijmons, D. and Feddes \(2002\)](#), the Layers-Approach is meant as a “quick witted policy instrument” that is strategic in organizing priorities in spatial planning and in analysing the positions, responsibilities and interrelations of the various actors. As a strategic instrument the approach is used to explain and organize relations between three layers and to distinguish the responsibilities and actions to be taken by the various levels of governance that are connected to these layers.

On the other side, the approach is used as a tool for spatial analysis to clarify how the three layers have influenced each other through the ages, with lessons for the future according to [Sijmons, D. and Feddes \(2002\)](#).



By approaching an urban region as a complex, layered, and dynamic system it will be possible to indicate the interrelations of various spatial processes. Within this complex layered system there are interactions among its three layers: the geo-morphological base (substratum), infrastructural systems in the middle, and finally land-use patterns (occupation). These layers or subsystems have different dynamics and development speeds but influence each other (see Figure 2). Mapping provides information about the ‘behaviour’ of a complex system – e.g. a delta region – focused on the way the three layers have influenced each other during the years. Based on this analysis, urgent key-issues can be identified regarding tensions between urban-economic and natural developments, aimed to discover the behaviour and path dependency of the system as a whole.

**Table 1**

		Design and planning tasks	Approaches
Layer 1	Substratum	<ul style="list-style-type: none"> <li>- Dealing with the physical effects of climate change</li> <li>- Modernising the water management system</li> </ul>	<ul style="list-style-type: none"> <li>- Nature engineering</li> <li>- Civil engineering</li> </ul>
Layer 2	Networks	<ul style="list-style-type: none"> <li>- Strengthening the position of the Netherlands in international networks</li> <li>- Control and steer the growth of mobility</li> </ul>	<ul style="list-style-type: none"> <li>- Complexes approach (developing nodes for exchange of information and knowledge)</li> <li>- Corridor approach (developing <u>mainports and hinterland connections</u>)</li> </ul>
Layer 3	Occupation	<ul style="list-style-type: none"> <li>- Accommodating spatial claims and shrinkage in relation to values and attractiveness</li> </ul>	<ul style="list-style-type: none"> <li>- ‘Ecology’-approach (An ecology defined as a locally characteristic ‘life-style-environment’)</li> <li>- Mold-Contramold approach (city vs. landscape)</li> </ul>
	Coherence	<ul style="list-style-type: none"> <li>- Creating synergy between interventions</li> </ul>	<ul style="list-style-type: none"> <li>- Conditioning spatial planning</li> <li>- Facilitating spatial planning</li> </ul>

**Table 1** Design tasks and related approaches as they appeared in the analysis of almost 50 Dutch spatial plans for the Netherlands. The analysis organised the plans using the layers model. Source: De Hoog, Sijmons, Verschuuren (1998b)

Figure 2. Layers-Approach, according to [De Hoog, Sijmons, and Verschuuren \(1998\)](#)

According to the Layers-Approach there are private domains (mainly occupation), public domains (networks), and the natural system (substratum). The public domain should mainly set priorities – in the western discourse – according to the dynamics of the different layers, and interact with the natural system the most. However, this clear order is subjected to a political shift from a centralized government to a market-based structure (a more or less similar process of decentralization is gradually happening in China) that allows for new forms of bottom-up governance styles. This shift has consequences for the order of the Layers-Approach because this means that the occupation layer gains more structural importance in an urban development while before this was designated to the network layer. The question is how the relationship between the occupation layer and the network layer can be the most effective and steered towards a more resilient way in future developments, especially also in relation to the substratum.

Two processes are especially hard to control in urban deltas in general: physical-territorial processes under influence of climate change, and societal processes. Currently in the European context there is a shift towards ‘building with nature’ to create more space for ‘bottom-up processes’ in the natural system (which is the bottom layer). It is important to create conditions for those systems or layer with the slowest dynamics (i.e. the

substratum), to prevent hazards such as flooding, and at the same time indicate how and where conditions for urban and economic development can be created. These dynamics are extremely important in policy-making and defining responsibilities. Since the Chinese practice is still lacking transparency (although this is improving gradually), a better understanding of these responsibilities will be extremely useful for understanding the status quo, possible risks, and actions to be taken.

The European planning context of top-down steering is gradually disappearing. Initiatives and steering comes more and more from local governments. Meanwhile the bottom layer (substratum) is also in a phase of transition in terms of governance, where the focus on water safety and water quality by strong government bodies has gradually expanded with the involvement of nature and environmental organizations in projects. Thus, both in the bottom layer as well as in the top layer, there are currently transitions in the European context where the traditional technocratic approach is gradually making place for a new, more organic approach.

In the Chinese context, there still is a very dominant steering from above, although the implementation by local governments usually is decisive, without much hindering by the central government, through lacking supervision and differing aims and ambitions. Therefore, the Layers-Approach needs some adjustments to be a handy tool in the Chinese context, to clarify and categorize the various levels of governance and the responsibilities and actions to be taken.

The Layers-Approach will be used for the case of Chongming, firstly by identifying the various factors that impact its spatial development. An overview will be given of the most significant space-altering initiatives that have been deployed on Chongming Island that influenced the rural-urban transition, especially since the year 2000 when the urbanization pressure accelerated ([Den Hartog, Harry, 2010](#)). The Layers-Approach will be followed to develop basic knowledge on the conflicts on every layer and the interrelations and interdependencies between the three distinguished layers. Bottlenecks in the usability of the Layers-Approach in the Chinese context will be identified and fixed where necessary.

Secondly, an overview will be given of the conflicting ambitions of the different policy levels: the national, the regional (Shanghai's direct-controlled municipality in the context of the wider Yangtze Delta) and the local level.

Finally, these initiatives and changes are categorized, with help of the Layers-Approach, to create a general overview of the direction the island is going. Based on this, some recommendations will be made to improve the spatial planning practice.

### **3. CASE OF CHONGMING ECO-ISLAND**

Chongming Island, strategically located in the midst of the Yangtze River's estuary just north of Shanghai, is China's national appointed Eco-Island, a wished-for model for sustainable development. One of its main features is Dongtan Wetland Park; an international, strictly protected Ramsar Zone for migratory birds.

However, Chongming Island's contemporary dynamics are extremely high. The household registration system on this island was changed into 'urban' in January 2017. This means that all the registered residents on the island will receive an urban hukou household registration, and thus direct



access to urban facilities ([Den Hartog, H., 2015](#)). Simultaneously the local government and developers have got more opportunities for urban development, although still with restrictions under the eco-island policy. This will add to the already existing urbanisation pressure on the island that started to accelerate in 2009 with a new bridge-tunnel combination that connects the island to the rest of Shanghai. Additionally, a rail-connection is currently in preparation.

Chongming is the world's largest alluvial island, although a large part was reclaimed with polders during the 1960s. Since the eighth century, it has gradually formed from several smaller islands and sandbanks in the estuary of the Yangtze River. The northern and north-western edges are reclaimed from the river with dikes. During the Cultural Revolution, the tranquil island was an exile for thousands of intellectuals who had to work on state farms. Since 1958 it has become part of the direct-controlled municipality of Shanghai, before it was made part of the Jiangsu province. Chongming District also contains two smaller islands.

Chongming District counts approximately 660,000 officially registered inhabitants living mainly a rural traditional lifestyle, in sharp contrast to the Central City of Shanghai. This number may differ from the actual number of people since many are registered here but living elsewhere, in particular, the younger generation is increasingly leaving the island behind to find opportunities in Shanghai or other cities. Meanwhile there are also unregistered migrant workers doing agricultural jobs or work on shipyards and related industries. The main island contains several shipyards and spread out industrial developments, as remains from the policies of the 1960s. There are four small towns with some industries for electrical equipment, pharmaceuticals, metallurgy alloys, card stock and steel, as well as weaving, and spinning cotton. The land is mainly used for agriculture (large state farms and smaller family farms), fishing farms (eel and Chinese mitten crab), cattle breeding, and since recently, extensive recreation. Nowadays most inhabitants work in the fields for low wages, and while younger generations move to Shanghai for career opportunities, their parents build oversized country houses filled with furniture waiting for them to return. Due to its remote location, backward image, and strict limitations on urban and industrial development caused by the Eco-Island policy (Chongming Island has been appointed by the Central Government in Beijing as an Eco-Island since 2001), the opportunities for economic development and employment are marginal. Currently the rate of population aging on Chongming is the highest in all of Shanghai (29.7% in 2013, according to Shanghai's Statistical Yearbook).

### **3.1 Transitions following the Layers-Approach**

This paragraph explains how a variety of human and natural interventions have changed the spatial structure of the island. This is explained further in this section following the classification of the Layers-Approach.

#### **3.1.1 Transitions and challenges on the substratum or bottom layer**

The coastline of the Yangtze River Delta has shifted eastwards over the ages. Recent land reclamations are in line with this and aim to keep balance with the expected future urbanization and agricultural needs. Besides the large-scale state farms on reclaimed land along the island's coastline (there are seven of them on Chongming Island built in the 1950s during the period

of the 'Great Leap Forward' policy) several recent land-reclamations have been used as 'land use compensation strategies' to allow the city of Shanghai to build urban areas elsewhere while guaranteeing food security. However, land reclamations make the delta as a system also more vulnerable to flooding and affect the ecological system negatively by losing wetlands ([Ke, 2014](#); [Wang, 2012](#)).

### **3.1.2 Transitions and challenges on the network layer**

On 31 October 2009, the first phase of the Shanghai-Chongming-Jiangsu Tunnel-Bridge project (six lanes and two rail lines) was opened, reducing a 45-minute ferry trip to a 20-minute car drive and making the island a target development site, as announced officially on the opening day. Shanghai is now within commuting distance. The intention to include one or more eco-cities into the initial eco-island plans was to ensure enough jobs in the long run and to prevent people from commuting, which is essential from a low-carbon point of view. Besides being a connection to the outside world, the bridge-tunnel combination is making property values rise quickly, causing high development pressure, although there are restrictions on building new housing and industries. Directly adjacent to the bridge the price per square meter of new real estate projects are at least four times higher compared to previous newly built projects elsewhere on the island. Simultaneously, almost all newly built residences are bought by the upper middle class living in the central city of Shanghai (the central city is defined as inside the outer ring road) as second houses or speculative objects and remain uninhabited (according to three local officials and five local real estate sellers that were interviewed by the author).

### **3.1.3 Transitions and challenges on the occupation layer**

Due to the improved infrastructure, a huge number of people visit the island for daytrips and weekend tourism, especially the wetlands, thus putting pressure on the ecological values there. Additionally, real estate values are booming. In mainly four locations, relatively large recreational real estate developments are taking place aimed at Shanghai's new upper-middle class who can afford a second home on the island for leisure and speculative investment. Chongming Island provides an attractive escape from the pollution and congestion of Shanghai, thus urban influence is likely to increase here.

To realise the ambition of making Chongming into a 'National Green Eco-Island' several economic compensation strategies have been put forward and rural tourism has become a new source of income. The number of visitors is still relatively low, because of the 'uncomfortable' lifestyle that contrasts a lot with the lifestyle of the new middle class in Shanghai and other neighbouring cities. According to the previous master plan for Chongming (2004; see Figure 3, below) one of the ideas to attract people to the island was to get Shanghai Disney there. Some entrepreneurs even launched the absurd idea to build a copy of Michael Jackson's Neverland Ranch and a zone for gambling. Although the Shanghai municipality fortunately has halted these initiatives, two golf courses and a resort with large expensive villas have been constructed, adjacent to the location of the planned eco-city. Another golf course is in preparation and there are also plans for horse racing tracks (for gambling) in consideration now.

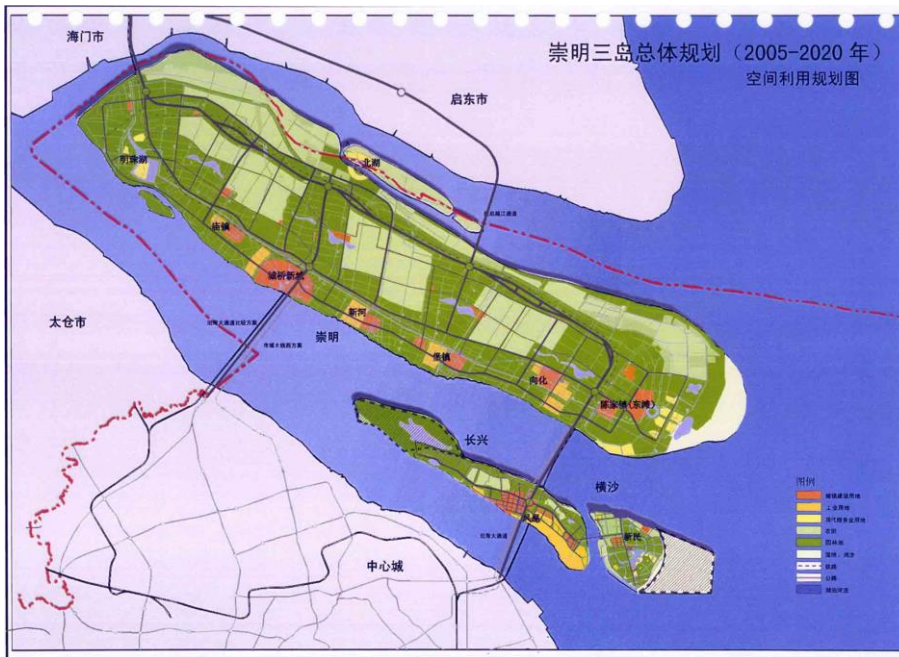


Figure 3. Chongming Master Plan 2005-2020

Recently more than 360 hectares of the former Dongping woodland has been transformed into Dongping National Forest Park for tourism. Simultaneously a part of the Dongtan wetlands (bordering the Ramsar zone with bird reserve) became an important tourist attraction, and on the former site of the Dongtan Eco-City, luxurious senior housing complexes are under development. These are without noticeable eco-features that differ from conventional housing, adding additional pressure on the local ecological and landscape values, especially since this car-based and quasi-Mediterranean architectural style built development is decorated with exotic flora – thus ignoring the local resources and eco-systems.

### 3.2 Conflicting policy ambitions

In China there are three *de jure* administrative levels, although *de facto*, the system is more complicated. Simplified the main three levels are: provincial level (Shanghai's Direct-controlled municipality is equal to a province), county and district level (Chongming used to be a county and became a district in 2017), and township level (Chongming island comprises of 19 towns and townships, of which two are situated in the Jiangsu Province). The difference between county and district is that a county has mainly a rural status and a district an urban status, with inherently different restrictions and regulations, such as the hukou household registration system that regulates access to services (Den Hartog, H., 2015).

China's governance system is currently organised in a strict top-down hierarchy. However, initiatives and decisions on a local level – especially by local governments, but also by the countless small and medium enterprises – are usually more decisive for achieving final results with far reaching consequences. Furthermore, there are huge discrepancies between top-down planning ambitions and daily life practices. Additionally, the economic and cultural gaps between urban and rural residents (as a result of the hukou household registration system) hinders the adaptation of local planning practices in rural areas such as on Chongming Island.

As opposed to most other countries, in China it is not possible to own land. China's land use system has mainly two types of ownership: state-owned urban land, and farmer collective-owned rural land. Although there are restrictions, rural land can be developed ([Huang et al., 2017](#)). Changing the formal land use from agricultural production to urban and industrial development is a critical process, especially in developing economies ([Yuan, 2004](#)). Developers can buy land-use rights, usually for 70 years in the case of residential land use and for 50 years in the case of industrial or commercial land use. Land use is strictly regulated and controlled, especially regarding agricultural use. However, as a result of economic reforms private investors can obtain land use rights from the government and even retransfer these rights to a third party. Consequently, land use leasing creates incentives for local governments to sell land use rights to generate income that can be used to finance urban, industrial and infrastructural projects ([He, Huang, & Wang, 2012](#)).

Since China was economically underdeveloped in comparison with western countries until late last century, currently the Chinese planning policies in general are in essence based on GDP-oriented motivations, aimed to catch-up economically. As a result, care for the environment and quality of life often is of secondary importance. China's latest Five-Year Plan however, indicates a demand for "People-oriented urbanisation", for which new planning approaches are needed. On a local level this meets many conflicts with local ambitions and practices, usually not looking beyond the political border, in combination with short-term goals, GDP-oriented motivations, a tabula rasa approach, and a lack of thorough market research combined with the urge to catch-up economically. This will be evident for the case of Chongming Island in the following section.

In 2001 Chongming Island was appointed as China's National 'Green Eco-Island' and pilot for sustainable development. However, so far this has resulted in several conflicts and misinterpretations ([Li, 2012](#)).

### **3.2.1 National policy ambitions**

In 2001 Chongming Island was earmarked as China's national model for sustainability, energy efficiency and environmental awareness, and it became a national experimental zone for eco-civilisation. During the years more than 40 local and international firms and organizations have been invited to participate in various studies and design competitions for the whole island as well as for special cases such as Dongtan Eco-City and other proposed new towns on the island. In 2004 the American firm Skidmore, Owings & Merrill's winning urban and agricultural master plan for the whole island presented a combination of advanced agriculture as the island's major economic engine plus several compact transit-rich cities for a total of almost one million people along the southern shoreline. From the results a general structure plan emerged, made by SIIC (Shanghai Industrial Investment Holdings CO.,Ltd.), a government-funded real estate developer, in close cooperation with the Shanghai Municipal City Planning Administration.

In 2003 McKinsey & Company and Arup from the UK were invited to produce a development strategy for the case Dongtan Eco-City, a zero-carbon development for 500,000 people, which would become a pilot project within the context of the wider master plan for the whole island. On 9 November 2005 Hu Jintao and the former Prime Minister of the United Kingdom Tony Blair signed an agreement on trade, science, technology and education. This included the implementation of the plans for Dongtan Eco-

City as a joint project between SIIC and Arup. The intentions of this international cooperation were to make the 86 km<sup>2</sup> (including wetlands, buffer and recreation) Dongtan Eco-City the first self-sustaining city environment on earth by minimizing CO<sub>2</sub> emissions and maintaining social and economic sustainability, according to the previous master plan (2004). Arup was asked to design a dynamic post-industrial model city with respect for its natural surroundings and a minimum of economic constraints. The project should make it clear that China is willing and able to achieve sustainable solutions in the context of rapid urbanization. After the much-debated Kyoto agreement, the first substantial sustainable city would not be achieved by a Western developed country but by China, following these ambitions.

However, due to a political problem with (amongst others) Shanghai's responsible Communist Party Secretary in 2006 and additionally exploitation problems, the Dongtan Eco-City project came to a dramatic halt. Since recently the construction activities on the site started again, but without the original eco-ambitions though. And with strictly limited numbers of square meters yearly to be developed, due to restrictive policies for this sensitive location near the Dongtang wetlands. The new main target group for the current residential developments is wealthy aging people, all from Shanghai, according to SIIC. Two golf courses have been developed previously, near the former eco-city site, and on the site itself luxurious villas and apartments are under construction, also without any additional eco-features, surrounded by green decoration, mainly imported exotic plants that cannot grow in a natural way without intensive care by gardeners. The term 'eco-island' has been abused for 'green washing' here.

### 3.2.2 Regional policy ambitions

Chongming is the last remaining mainly rural and open part within Shanghai's direct-controlled municipality. Regionally the island can be seen as a green lung in the context of the densely populated Yangtze River Delta Region.

However, Shanghai's government has been looking at overall priorities in terms of development options around Shanghai since late last century. The island used to be one of the main rice bowls of the region, but this function seems to have become less important now. Chongming Island as a whole presents clearly a major opportunity for development. In the late 1990s, before the development of Lujiazui, there were already serious ideas to make 'a second Hong Kong' on the south-eastern tip of the island, a Special Economic Zone according to professors who have been involved as advisors for the eco-island concept development. Mainly due to the remote location and the still missing bridge, finally it became favourable to choose Lujiazui as a CBD and other parts of Pudong as Special Economic Zones, but not Chongming. This was in the late 1990s just before the Eco-Island policy was introduced.

This Eco-Island policy aims to safeguard the island from massive urban development to preserve especially the natural, but also agricultural qualities of the island. However, the recent conversion of the island into an urban district (since January 2017), and the earlier construction of the bridge-tunnel combination and the scheduled rail connection, make it very clear that regional ambitions still go further than keeping the island rural and green.

### **3.2.3 Local policy ambitions**

Since the population is aging rapidly, due to lack of attraction and employment opportunities for younger generations, the local ambition is to generate income with real estate development projects and some additional (eco) tourism, aimed at the new middle class of the central city in Shanghai.

In the Master Plan for Chongming Island (2001) a series of new towns and (light) industrial zones have been scheduled along the south coast to support the local economy by creating jobs and facilities for the island's inhabitants. Since the start of the eco-island policy these new urban cores, which are mainly extensions of already existing settlements, have developed gradually, according to plan. Meanwhile however, on a smaller scale many sprawling developments have taken place in the rural areas where farmers have built countless new houses for themselves and for their offspring – similar to elsewhere around Shanghai and in the wider Yangtze River Delta Region. It seems that the restrictions on land use and construction activities have only partly been efficient so far, although since recently there is more strict supervision on limiting the building of new rural housing.

The township Haiyong, which is located at the northern tip of the island and belongs to the Jiangsu province, is illustrative of what can go wrong if there is no supervision. As a result of the natural sedimentation process over the years, the old natural border, on which the municipal border is based, has shifted to the north. As a result, almost 50 square kilometres of the 1,271 square kilometre large Chongming Island belongs to the Jiangsu Province, which is not covered by the National 'Green Eco-Island' policy. This part belongs to the township of Haiyong, which is under the jurisdiction of the City of Nantong on the other side of the river, who have greedily used this opportunity to develop a new town here for 100,000 inhabitants, named 'Long Island'. The development started with reclaiming land on top of former wetlands and tidal flats in 2013, which is relatively easier than converting agricultural land use into urban land use. In 2015 housing construction had already started, mainly villas and 40-floor-skyscrapers, which are technically full of risks such as subsidence and flooding. The worst problem is perhaps the ecological damage. More than five square kilometres of former wetlands have been erased here in favour of profitable real estate. More than 95% of the buyers of this real estate are families from Shanghai, who use these houses purely as speculative investment opportunities and possible weekend retreats, thus are not for their main living.

This so-called 'Long Island' project was initiated by the municipality of Nantong and Greenland, a large real estate developer from Shanghai. Warned by news coverage on CCTV late last year the central government in Beijing brought a halt to this project. Currently, a core team of specialists from Jiangsu province and Shanghai's Direct-controlled Municipality are trying to reach a consensus on how to proceed with this project. The first idea is to massively reintroduce greening here by planting trees. Some of the already built skyscrapers might also be destroyed as a symbolic act.





Figure 4. Sales centre for real estate on former wetlands (Photo by author, 2017)



Figure 5. Remnants of wetlands, waiting for urban development. On the horizon high-rises in the Haiyong township in Jiangsu Province, constructed since 2014 on former wetland and tidal flats. (Photo by author, 2017)

There obviously is no strict supervision on the implementation of the master plan and Eco-Island policy regarding land use limitations, at least not in the part that belongs to Nantong. Furthermore, the local government, both on the district level and township level, seem to have slightly different interpretations about the translation of the eco-island ambitions into practice. A big share of the implemented greenery along main infrastructure routes,

e.g. in Dongtan and Haiyong, is imported exotic and decorative greenery, and without much ecological value.



Figure 6. Wetlands north of Haiyong township in 2004 (Source: Google Earth, 11 February 2017)



Figure 7. Same location as Figure 6, Haiyong township with land reclamation and real estate development (Source: Google Earth, 11 February 2017)



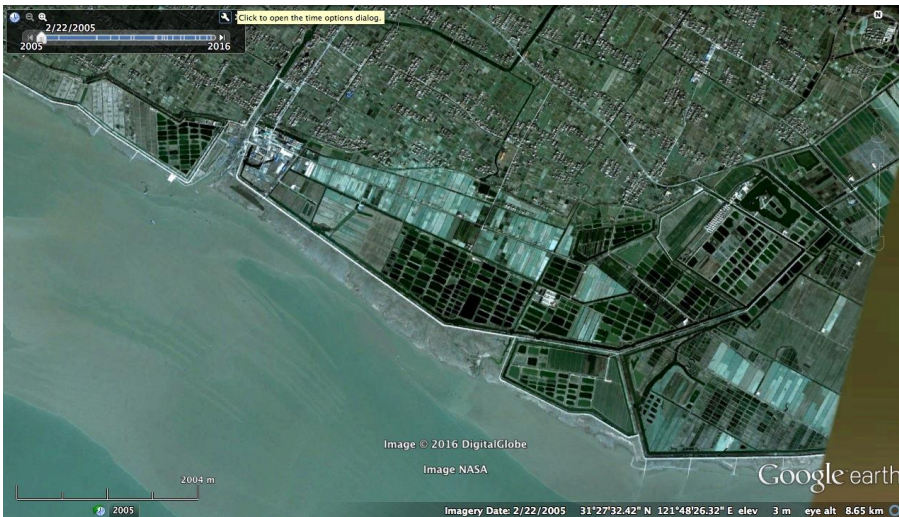


Figure 8. Dongtan in 2005 with fish farms and rice paddies (Source: Google Earth, 11 February 2017)



Figure 9. Same location as Figure 8, Dongtan in 2016 with golf courses and villas (Source: Google Earth, 11 February 2017)

#### 4. DISCUSSION

China's rapid changing economy and society are not reflected in a change in spatial planning: the city is still regarded as 'a machine for living' without a direct relationship toward its natural, historical culture nor societal context.

Planning practises in China are mainly based on a tabula rasa approach, resulting in serious disturbances and conflicts between the different layers following the Layers-Approach. The bottom layer, the substratum, is often ignored.

In the Western discourse, however, the Layers-Approach promotes the bottom layer, the substratum, as the leading one in setting governance priorities. The middle layer, the infrastructural or network layer, functions as steering, to serve the occupation layer, although this is changing. In the case

of China, the Layers-Approach can be seen as a guidance tool to set priorities again for the substratum as foundation, to respect ecological values and to learn how to build with nature. However, the practice in China, as illustrated for the case of Chongming, is very different from this theory. The urge to catch-up economically gives the occupation layer absolute top-priority. Meanwhile the network layer is still serving, though usually totally ignoring the substratum.

Planners and policymakers in China have neglected the rural areas around Shanghai during the last two decades, while all attention went to urbanization, and followed the ambition to change Shanghai's Central City into a service-oriented prosperous international metropolis. One of the side effects of this is a serious polluted rural water system and the disappearance of many traditional water based rural communities.

The international expectations about the definition and implementation of an eco-island also do not match in the case of Chongming, since there are different priorities and aims, especially on a local level. The development of China's rural areas, in this case the rural fringes of Shanghai, are obviously in a different development phase with very different social and economic priorities. There is a pressing urge to catch up economically. Furthermore, there seems to be a discrepancy between top down planning ambitions, local practices and daily life.

Moreover, the eco-island policy on Chongming is not strictly controlled and implemented all over the island. The eco-label locally has been explained as 'green decoration' to market real estate and improve a feeling of comfort for the new middle class. Chongming Island is in a phase of beginning gentrification where the new (upper-) middle class is taking over while ignoring the local socio-cultural and spatial qualities. The trend is that main parts of the island become a backdrop for the city, which can be beneficial for the island economically, but conflicts strongly with the eco-island promises.

The main challenge is to find a balance between economic growth and protection of the environment and spatial qualities. Currently the increasing focus on eco-tourism and elderly communities (some consist of more than a thousand units, even with high-rises) forms a threat for local spatial qualities and, in some cases, also for ecological qualities.

A new spatial planning approach requires a search for a new balance between, on one side, the physical-spatial system of the urban delta and the needed interventions, and on the other side an adjusted practical governance system, in which the challenge is to find the best way of matching bottom-up and top-down processes. In the Chinese context, the top-down approach is still omnipresent, but in reality initiatives and decisions on a local level, by local governments and developers, sometimes even by (influential) local residents, are far more critical factors.

Since recently China's spatial planning and design climate has been in transition, gradually opening up, and shifting toward more small scale and locally oriented developments. Another glimpse of hope is that on a small scale there are more and more promising local initiatives, often with the help of citizens from elsewhere who are willing to 'adopt' rural lands – for example eco-farmers, who also play a role in disseminating knowledge on things such as organic farming to local farmers, community-supported agriculture or even facilities for eco-tourism.

To steer the spatial development into a more resilient direction, an integral approach is essential. This needs to go beyond the Layers-Approach and should also include socio-economic and social-cultural factors.

Residents and other stakeholders on Chongming Island, and also in many other rural cases, are facing different priorities and needs. Daily realities also need to be considered in the spatial planning and other development policies, otherwise it will be hard to steer spatial development in a sustainable way. The increasing economic and cultural gap between local residents and newcomers on the island leads to fundamental conflicts, with dramatic spatial, ecological and socio-economic consequences. Knowledge dissemination and capacity building under local stakeholders is crucial. Simultaneously, better guidance and supervision are essential, preferably by a team of independent experts. The Layers-Approach can become a handy tool in this to distinguish priorities and responsibilities by policy choices. Consequently, the relationship between the occupation layer and the network layer can become more effective and be steered towards a more resilient approach in future developments, especially also in relation to the substratum. Re-appreciating and working with existing natural values, landscape and water systems, could become a new pathway, consequently mitigating the vulnerable balance between nature and society and making the delta as a system more resilient.

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## CONFLICTS OF INTERESTS

The author declares no conflict of interest.

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